04 16 46 58	CDR	Okay, Ken. I think it is a pretty good one; that's one thing we have practiced a lot. But we might as well let everybody know what we're doing.
04 16 47 07	CC	Roger.
04 16 47 43	CDR	Ken, while we are just killing time here, there are a couple of anomalies we've noticed. The booties, you know, for the inflight coveralls: mine have frayed very badly, and I had to take them off. Also, we had one Y adapter with an open in it, and the lightweight headsets were kind of useless.
04 16 48 04	CC	Roger.
04 16 48 12	CDR	I take that back. I really didn't mean to say that. The lightweight headset - what I really meant to say was - the lightweight headsets are useless.
04 16 48 22	CC	Okay.
04 16 48 30	CDR	But these Snoopy hats are pretty comfortable. We have worn them the whole time.

END OF TAPE

04 16 51 58	CDR	Ken, one thing we are going to do on these suits, we're going to stow them one under each seat, the way North American suggested.
04 16 52 06	CC	Roger. And you'll be putting the helmets in the food stowage.
04 16 52 16	CDR	Yes, I think we'll put the helmets in the food stowage; and any stuff we have to take out of there, we'll just stick in a suit.
04 16 52 22	CC	Okay.
04 16 52 30	CDR	Is the weather still good out there?
04 16 52 33	CC	It's not quite as clear as it was yesterday; it sure is nice and balmy.
04 16 52 40	CDR	No, I mean out at 165 west.
04 16 53 45	CC	Okay. Frank, we've got a weather picture here. The forecast shows 2000 scattered and 4000 broken with a high overcast. You might see that as you come down through it, and wave heights 4 feet, wind about 070 at 12 with 10 miles visibility and perhaps some scattered showers in the area, and this is forecast for the twenty-seventh at 16:00 Zulu.
04 16 54 19	CDR	Very good; we'll be there.
04 16 54 22	CC	Yes, I'm sure you will.
04 16 54 28	CDR	I don't think those waves are too high. We're going to have to sit in this heap for about 45 minutes.
04 16 54 39	CC	Okay. We'll put in a kit for some small waves.
04 16 54 47	CDR	Tell Jerry Hammack if the waves get high, it's his fault.

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04 17 09 51	CC	Apollo 8, Houston.
04 17 09 55	CDR	Go ahead.
04 17 09 56	CC	Okay. Why don't you drive it back over to the PTC attitude and put it back in ATTITUDE HOLD for the roll, and we're going back in and review the DTO requirement. You have about the same results, it looks like, on a cursory analysis all three times. So we're going to take another look and see if there is any reason to do it again. If so, we'll call you. You can go ahead and put it back in ATTITUDE HOLD now.
04 17 10 23	CDR	Okay, Jim. Thank you.
04 17 45 03	CDR	Houston, Apollo 8. Radio check.
04 17 45 05	CC	Loud and clear, Apollo 8.
04 17 45 11	CDR	Okay, Ken. Thank you.
04 17 45 13	CC	Roger. It is taking us a little longer to go through and rehash all of the entry checklist than I thought, and we are just about to wrap it up now.
04 17 45 24	CDR	No problem. Just watch my gimbal angles for me, and give me a call if they get too close.
04 17 45 29	CC	Roger. We will watch them.
04 18 19 19	CC	Apollo 8, Houston.
04 18 19 24	CDR	Go ahead.
04 18 19 26	CC	We would like to look at a couple more DELTA-V tests on the EMS, and the general consensus is that we don't think there is any particular problem.

We'd like to go ahead and take a look at what you get by running four or five more DELTA-V tests. And prior to that, we'd like to run one of these null bias tests; and since we don't have any way of monitoring any of this stuff on the downlink, I'd like to have you tell us each step when you turn the switch and different orders and things like that.

04 18 20 08	CDR	Okay.
04 18 20 41	CDR	Alright. I'll run a test.
04 18 20 48	CC	Okay. The first thing we want is this null bias, 100 seconds.
04 18 20 54	CDR	You stand by, and I'll do a null bias for 100 seconds. Do you want me to put DELTA-V in AUTOMATIC and let it alone for 100 seconds?
04 18 21 02	CC	That is affirmed.
04 18 21 22	CDR	Going to DELTA-V; going to AUTO -
04 18 21 25	CDR	Now.
04 18 21 27	CC	Roger.
04 18 21 45	CDR	Went to one-tenth and back to zero.
04 18 21 50	CC	Understand; plus one-tenth and back to zero.
04 18 21 56	CDR	One-tenth, now it's a minus one-tenth and back to zero; no, it's not zero yet; wait a minute.
04 18 22 29	CDR	Now it's up some, minus 4; 0.4, that is.
04 18 22 33	CC	Roger.
04 18 22 44	CDR	Minus 25.

04 18 22 46	CC	Roger.
04 18 22 53	CDR	Minus 26.
04 18 23 06	CDR	Minus 0.7, and there is 100 seconds; minus 0.7 at 100 seconds.
04 18 23 12	CC	Roger.
04 18 23 17	CDR	Now what do you want?
04 18 23 19	CC	Okay. If we go back to mode, switch to stand by and FUNCTION switch OFF.
04 18 23 36	CDR	Roger.
04 18 23 37	CC	Okay. Now we'd like to do a couple of DELTA-V self-tests.
04 18 23 38	CDR	Okay. 71586.8.
04 18 23 43	CC	Roger.

END OF TAPE

04 18 24 46	CDR	Say you're going AUTOMATIC?
04 18 24 48	CC	Roger.
04 18 24 51	CDR	Going to a DELTA-V test now. Counting down.
04 18 26 04	CC	Apollo 8, Houston.
04 18 27 14	CC	Apollo 8, Houston.
04 18 28 47	CDR	You back, Ken?
04 18 28 49	CC	Apollo 8, this is Houston.
04 18 28 53	CDR	Roger. Read you.
04 18 28 55	CC	Okay. We got caught in a station handover there. I didn't copy anything after you said you were putting it to DELTA-V test.
04 18 29 06	CDR	I ran - I ran three tests during that handover. Two over minus 19.6 - two of them are minus 19.8; and one of them, minus 19.6.
04 18 29 17	CC	Okay. That sounds real fine.
04 18 29 22	CDR	Roger.
04 18 29 24	CC	Okay. The other thing that - sometime prior to entry - and we're going to be looking at it - is the normal entry test pattern, and it's called out presently in the checklist as something we do around an hour. And we'd like to check if you can read the number on the scroll that is up now so we can see where we are in the test test pattern sequence. We're considering taking a look at one of these test patterns before we get into an hour so we can have more time to

		think about it in the event that there should be something anomalous in it.
04 18 30 02	CDR	Why don't we do it right now? We're on number 8.
04 18 30 06	CC	Okay. Understand; that's number 8, right?
04 18 30 12	CDR	Roger. It takes an awful long time to run them over there anyway. It won't hurt to do one.
04 18 30 18	CC	Okay. If you'll stand by just a second; we're checking to see where we stand in the sequence of events for on pattern 8.
04 18 32 58	CDR	Hey, Ken.
04 18 32 59	CC	Yes, sir.
04 18 33 03	CDR	Another little thing about this EMS: you know, we had it set up when we separated from the booster - -
04 18 33 09	CC	Roger.
04 18 33 10	CDR	- - and the shock of the separation - the shock of the pyro's blowing in separation knocked it up to 100 and something.
04 18 33 21	CC	Understand. Knocked it up to 100.
04 18 33 26	CDR	Roger.
04 18 33 27	CC	Was the pyro separation enough that the - you felt a sensable g in the bird?
04 18 33 35	CDR	Roger. Let's just say there wasn't any question we were separating.
04 18 33 43	CC	Roger. Understand.
04 18 34 00	CDR	While you are checking the scroll, find out which entry pattern I should be using this bird in.

04 18 34 06	CC	Okay. Will do.
04 18 39 39	CC	Apollo 8, Houston.
04 18 39 44	CDR	Go ahead.
04 18 39 46	CC	Okay. While we are verifying that scroll position - they are talking it over in the back room about that now - I would like to go ahead and run down the checklist with you for entry.
04 18 40 00	CDR	Go ahead.
04 18 40 02	CC	Okay. Looking on entry 1: the second item there is the 12-hour Kelvin cold soak, and in discussions here and preflight, I think it is agreed that we don't want to do the cold soak there. So we are going to delete that step 2. And what it amounts to is, I think we do want to do a cold soak, and we certainly want to exercise the water boilers prior to entry in order to insure that we don't have one that is dried out, in the same manner that we had one dried out prior to LOI. And we are working on some procedures for that, and we'll have to come back to you with those a little bit later, and we will try to do it sometime when Bill's on the line so that everybody can get in on the loop at the same time. We would like to add a step between 8 and 9, or as part of step 8. This is all on page E-1, where we turn the VHF to Simplex A at minus 4 hours and 35 minutes. Now this will be beyond two-way VHF range, but it will make sure

that we do have it on at the time when we pick it up. We were able to get out to 20 000 miles with a downlink, and we are checking on the uplink signal. So if we put it on at this point, we know we have it on well in advance of any time we might be able to get into the VHF.

04 18 41 36 CDR Okay.

04 18 41 43 CC Okay. I guess maybe I have that backwards. They copy - you folks copied the VHF out to 20 KM. We're checking on the - on the downlink into that now. But in any event, this 4 hours and 35 minutes will get it well in advance of that.

04 18 42 03 CDR Roger.

04 18 42 40 CC Okay, 8. We just got an answer back on the test patterns. We thought it was - We had 25 test patterns which are allocated to ground test, and these are the ones we've been looking at. Then there are five more that are allocated to flight, and the only difference in these patterns is that the flight patterns have instructions actually written on them; so if we are looking at test pattern 8, that means that we're still working on the ones that were allocated to the ground test, so there was no problem there. And I'll get you a number for which pattern we should be using for entry; working on that one right now. So we would like to go ahead and run through these.

04 18 43 21	CDR	I don't mean the - -
04 18 43 23	CC	Say again, Frank.
04 18 43 25	CDR	I don't mean the test pattern. I say, I don't mean the test pattern. We asked them to put the supercircular on the number, the first place on the scroll; I'm sure they did. I'm sure it's the first pattern, but I just wanted to make sure that's right.
04 18 43 38	CC	Roger. That's why we are trying to verify. So - -
04 18 43 43	CDR	You want me to run through a test pattern?
04 18 43 45	CC	Yes, sir. If you would, please. And if you'd tell us each step as you go through it.
04 18 44 42	CDR	Okay. Going through step 1; EMS test 1: wait 5 seconds. There's 5 seconds. Going AUTO. Okay. Indicator lights are all OFF; the range is zero, zero. Now I'm gonna slew the hairline over the notch. Okay. And now we go in EMS test 2.
04 18 44 45	CC	Roger.
04 18 44 52	CDR	Got the 0.05g light; all others are out.
04 18 44 55	CC	Roger.
04 18 44 58	CDR	Go on test 3: far side lower light on 10 seconds; going to set the range counter to 58. Okay. Set at 58; going to test 4.
04 18 45 34	CC	Roger.
04 18 45 50	CDR	Beautiful. It's perfect. It's right in the corridor. It comes down and stops at zero, zero.

04 18 45 55	CC	Very good.
04 18 46 04	CDR	Go in test 5: perfect again. Okay. Now I go to range set,
04 18 46 34	CC	Okay.
04 18 46 39	CDR	In STANDBY.
04 18 46 43	CC	Okay.
04 18 46 45	CDR	Okay. That was perfect.
04 18 46 47	CC	Real fine.
04 18 47 02	CC	Okay, Apollo 8. I'd like to run one more null bias and looks like we will have exercised everything we can get to.
04 18 47 13	CDR	Okay. DELTA-V AUTO, all zeros.
04 18 48 21	CDR	Minus 2.
04 18 48 24	CC	Roger. Understand minus 2. Alright. Is that minus 2 or minus two-tenths?
04 18 48 39	CDR	Two-tenths, three-tenths now.
04 18 48 42	CC	Okay. Real good. That looks like we - -
04 18 48 44	CDR	It looks like we had a lot of noise on the circuit for a while there, Jim.
04 18 48 50	CC	Yes, we did, too; all those electronic glitches I guess.
04 18 48 59	CDR	Okay. One hundred seconds it's plus - minus four-tenths.
04 18 49 02	CC	Okay. Real fine. That looks like that's about all of the functions that we can check, and looks like everything is just down the line.

04 18 49 15	CDR	Roger.
04 18 49 19	CC	Okay. We still owe you confirmation that you can expect your high speed scroll to be the first pattern you come to, and I'll let you know as soon as they come in with an answer on it.
04 18 49 31	CDR	Okay.
04 18 49 32	CC	I'd like to go ahead and finish going through the entry book if you're ready.
04 18 49 37	CDR	Roger.
04 18 49 43	CC	Okay. We've reviewed most of the book up here, and we will have to come back and suggest a way that we can check out the water boiler prior to getting reentry area. We've reviewed all of the last minutes changes that were put in - pen and ink type things - and they're all looking good. On page E-7, like to add a couple of items.
04 18 50 15	CDR	What's that?
04 18 50 16	CC	Okay. On step 34 under final stowage, which is a sort of catch-all area, there's a step that says secondary glycol to radiator that bypass verify. While we are down in this area, we would like to go to panel 382, the water control panel, and set up the evaporator water control valve both primary and secondary to AUTO. Now this is something we would have done had we done the cold soak at minus 12 hours, but since we

weren't doing it there, we would like to go ahead and make sure we have these in AUTO, and this will enable automatic controls from the panel.

04 18 51 02 CDR Can we just make this part of the procedure when we test out the water boilers beforehand?

04 18 51 08 CC Yes, sir. If we get that checked out earlier, we can just leave them in AUTO.

04 18 51 13 CDR I'd rather do that.

04 18 51 15 CC Okay. I'm just going to make a note here, and we can do it the other way, too. The other item that was pen-and-inked in - -

04 18 51 23 CDR ...

04 18 51 27 CC You may already have this down as step 35. It says UP TELEMETRY to BLOCK, VERIFY, and there's a step right after that that says RCS command module heaters to circuit breakers CLOSED.

04 18 51 43 CDR Roger.

04 18 51 48 CC Okay.

04 18 51 49 CDR I have that.

04 18 51 50 CC Okay. I guess that one was sent up to you this afternoon. And when you turn the page over to E-8, it shows the EMS entry check being run at minus an hour, and you know that it's a short test. There is really no reason to wait for an hour; we might as well go ahead and do that as

soon as you get through with step 35 on page E-7 because we're coming up on a pretty busy period.

04 18 52 19 CDR I say that's fine; we'll do that.

04 18 52 37 CDR Houston, are you still there?

04 18 52 39 CC Roger. We got a discussion going; be right back.

04 18 53 50 CC Okay, Apollo 8. On page E-9 - -

04 18 53 57 CDR Okay.

04 18 53 58 CC - - at the top of the page, you have step 38, and right underneath that, prior to step 39, we want to have a primary glycol loop activation. What we are doing is to get the glycol evaporator water switch to AUTO and the glycol evaporator steam pressure switched to AUTO. This will get your primary water boiler on the line prior to entry, or at least it'll enable it.

04 18 54 35 CDR Okay. Tell me what to write in, Ken.

04 18 54 37 CC Okay. It's glycol evaporator water to AUTO.

04 18 55 43 CC Apollo 8, Houston. Are you there?

04 18 55 55 CDR Glycol evaporator water switch to AUTO.

04 18 55 59 CC Okay. And the second switch is the glycol evaporator steam pressure to AUTO.

04 18 56 18 CDR Okay.

04 18 56 25 CC Okay. That takes care of getting the primary water boiler enabled, and it's my understanding that we were going to make the actual entry with

both the primary and the secondary water boilers on the line.

04 18 56 40 CDR I'm not reading you now, Houston.

04 18 56 44 CC Roger. How now?

04 18 56 48 CDR Loud and clear.

04 18 56 49 CC Okay. There's some question from reading the checklist. It is my understanding that both the primary and the secondary water boilers will be ON for the actual entry, and don't find a place in the checklist where it's actually turned on. So we'd like to get confirmation on that, and we'll make sure that we have all the proper switching to put in the checklist.

04 18 57 16 CDR Okay.

04 18 57 23 CC Alright. Still on page E-9 and under step 39 at the bottom of the pyro circuit check, there's a step that says panel 8, all circuit breakers CLOSED except and then it lists five that are printed, one that was pen-and-inked before launch. It says EDS power circuit breakers 3 OPEN, and to be complete, we ought to add the RCS heater circuit breakers. There's two of those, and they should also be OPEN.

04 18 58 06 CDR Okay.

04 18 58 11 CC Alright. The rest of these pages look good; I'm coming over through the graphs. And on page E-11 - -

04 18 58 48	CDR	Roger. I'm with you.
04 18 58 50	CC	Okay. On step 5 on E-11, there's - the first subtitle there is Helmets and Gloves, and the items that follow beneath that are affected by whether you wear suits or come in shirt sleeves, but they do have to be accomplished. And the suit return air valves would actually be OPEN for a shirt-sleeve entry. And you should have a line penciled in of optics power to OFF between an emergency cabin pressure valve and the time when the CMP moves to the couch.
04 18 59 26	CDR	Right.
04 18 59 28	CC	Okay. And the step shows the tape recorder to REWIND at minus 30. Now that's an onboard step rather than a ground step, just to verify that.
04 18 59 48	CDR	Okay.
04 18 59 50	CC	Okay. Under step 6, almost at the bottom - in fact, it's three lines from the bottom of step 6 - there's a section that says secondary coolant loop evaporator to RESET, and should be a note that that's 58 seconds if you hold it in RESET prior to moving the pump OFF.
04 19 00 12	CDR	That's it; that's in it.
04 19 00 15	CC	Okay. Okay. The next comment is on page E-13.
04 19 00 34	CDR	Okay. I'm there.
04 19 00 36	CC	Alright. This is a general comment that refers to any time you're working around P62 or when

you're going between P62 and P63, and you should be careful not to call an extended VERB during this time. This is here in the program notes, and it is just a reminder. What will happen if we get into an extended VERB such as an 83 or an 82? We may get hung-up in P62 and have to recycle through it in order to get the 63, and neither of these displays are normally used, and it's just a good practice. And we're just trying to remind you that we don't want to call an extended VERB while we're in P62.

04 19 01 22	CDR	Okay. Neither do we. That's right.
04 19 01 24	CC	Okay.
04 19 01 41	CC	Okay. In going through the rest of it, we didn't find any other things to make comments on. You have all the latest corrections in your checklist.
04 19 01 51	CDR	Roger. The main thing, that is to come up with a way to determine that the boiler - water boiler is not dry and make sure that Bill gets it activated at TMS 7.
04 19 02 03	CC	That is correct, and we will talk to you some more about that next time we catch both you and Bill up.
04 19 02 10	CDR	Righto.
04 19 06 41	CDR	Ken, this is Frank. I am going to be off the headset for about 5 minutes here.

04 19 06 44	CC	Okay. Fine. When you come back, I will have a systems rundown for you.
04 19 06 50	CDR	Fine.
04 19 17 12	CDR	Houston, Apollo 8.
04 19 17 16	CC	Okay. Loud and clear.
04 19 17 20	CDR	Back with you.
04 19 17 22	CC	Okay. I've got a few good words for you. The erasable memory has been taken completely apart and looked at, and it looks like it's all okay. Your P01 didn't have any effect. The one thing that might be questionable is if you used a VERB 67 when you get to the NOUN 99 display, you may find that one to be unreliable, and what you're going to get there is the - that's an error display for the W-matrix. And it's something you probably won't be using again anyhow; and if the occasion arises, we can update that one, but it's not a normally used display and everything else, all the operational functions, are good.
04 19 18 17	CDR	Very good.
04 19 18 19	CC	Okay. As of 114 hours, your batteries - you had battery A with 39.32 amp-hours, battery B had 35.21, and battery C 38.46. Your cryo quantities remaining at SEP were the same we gave you the last time, 180 pounds of oxygen per tank and 11 pounds of hydrogen per tank. At

present, the service module RCS, using the computer values for the quantities, you have quad A with 55 percent, Bravo with 50, Charlie with 58, and Delta at 48. What we plan to do with the secondary tanks is to go ahead and turn them on at 37 percent actual, and in the event of lost COMM or something like that, recommend that you use 50 percent onboard gaging as being the time to turn the secondary propellants on. However, as long as we can use our own calculations, why, we might as well leave them tied up. We probably won't get into the secondary propellants prior to entry anyhow.

04 19 19 41	CDR	Roger.
04 19 19 42	CC	Okay. A couple of items I want to check up on: I'd like to confirm that the hatch Dog will be taken off while you're on the chutes if you can. If not, you're going to do that in the water. Is that affirm?
04 19 20 00	CDR	...
04 19 20 13	CC	Okay. Now we've got a little better sign 1. Like to confirm that the hatch clamps on the side hatch will be taken off either on the chutes or in the water, whichever you can get to. Is that affirm?

04 19 20 37	CDR	Roger. That's affirm. As a matter of fact, we didn't even put - didn't even put them on.
04 19 20 45	CC	Okay. Do you plan to put them on for an entry?
04 19 20 50	CDR	I don't think so. It's held pretty well so far. I don't think - everybody tells me it wouldn't help much anyway.
04 19 21 58	CC	Okay. And we realize we never did find out what happened to the Mae West. Did you leave it blown up, or did you dump it?
04 19 21 09	CDR	We dumped it.
04 19 21 12	CC	Okay. Who was the lucky guy?
04 19 21 17	CDR	The same guy that tried to launch us this afternoon again.
04 19 21 23	CC	Okay. And just as a gee whiz item:you're now a 137 915 out, and you've only accelerated the 4883. You might check to make sure you don't have a speed brake hanging.
04 19 21 41	CDR	Uh-oh.
04 19 21 44	CC	Those are nominal values.
04 19 21 50	CDR	Roger. 137 000 miles out, huh?
04 19 21 55	CC	That's affirm.
04 19 33 18	LMP	Houston, Apollo 8. Over.
04 19 33 20	CC	Loud and clear.
04 19 33 27	LMP	Good morning, or good afternoon, or whatever it is. The JOD is back at the CON; CDR went back to bed.

04 19 33 32	CC	Okay.
04 19 33 44	CC	Looks like all the junior guys have the midwatch.
04 19 33 49	LMP	I know what you mean. I had a little sleep earlier, so I am pretty well rested and want to make sure Frank gets a good snooze here prior to entry. This might be a good time to try out your background music, and see if you have any better luck.
04 19 34 16	CC	Okay. We'll try that a little later.
04 19 37 48	CC	Apollo 8, Houston.
04 19 38 43	CC	Apollo 8, Houston.
04 19 38 49	LMP	Go ahead, Houston.
04 19 38 51	CC	Okay. I guess we should start off with a little dialogue about sleep. How much did you have?
04 19 39 03	LMP	Well, let's see; whenever it was I told you I went to bed last night till now. Just a second and let me check the flight plan.
04 19 40 48	LMP	Have you got it logged in when it was I asked for that last Seconal?
04 19 40 57	CC	Okay. I guess we can figure that out for ourselves, can't we?
04 19 41 02	LMP	Yes. Why don't you let me know. I have kind of lost track of time it was when I went to bed. But it was about - I went to sleep about 15 minutes after that and woke up about 10 minutes ago. Good sleep.
04 19 41 12	CC	Okay. So I see it is now 142 hours.
04 19 41 27	LMP	What do you think I am, Rip van Winkle?

04 19 41 30	CC	Just trying to find out how soundly you really slept. I guess you are not that sleepy.
04 19 41 36	LMP	... but not that.
04 19 41 40	CC	Okay. It's really about 4 hours, Bill.
04 19 41 50	LMP	Okay. Good.
04 19 42 39	CC	Apollo 8, Houston. Have you got somebody under the left couch, or could you get down to the water control panel?
04 19 42 49	LMP	I can get down there. Frank hasn't quite gone to sleep yet.
04 19 42 52	CC	Well, what we were thinking about doing was boiling a little out of the secondary evaporator to check it out, just as a component check, something we need to do; but if there's somebody down there in the way, why, we can do that some other time.
04 19 43 17	LMP	Well, if it boils, we are going to know it before - it won't take long to find out it won't boil. There's not a heck of a lot we can do about it, so why don't we wait until someone else wakes up here, Frank wakes up again. How will that be?
04 19 43 27	CC	Yes. That would be fine. There is something you can do; you can reservice it. And it is kind of a tedious process, and that's the reason why we just want to kind of keep our eyes on it so we will have some idea prior to entry if we can count on having two loops or one. Which kind of leads us into

another question we are trying to pin down, two questions, in fact. Number one, we would like to verify that you do plan to use both primary and secondary boilers during the actual entry, and we are also looking for a way of checking the primary boiler to make sure it isn't dried out prior to entry. And that is turning into a little more of a challenge than you might suspect. If you have any thoughts on that subject, we can go over that.

04 19 44 21 LMP The answer to the question is yes, we do plan to use both. Before we get into the water boiler pump though, CDR would like to take a Seconal also; make sure he can get off to sleep here.

04 19 44 41 CC Okay. That's a GO.

04 19 44 46 LMP Okay. On the water boiler: it's interesting that I get my own - I was going to say anytime you have your mike keyed, I can hear myself talk with about a 2-second time delay. With respect to the primary and secondary boiler checks, I think that is a good idea to make sure we got them both prior to entry and have the reservicing procedures handy.

04 19 45 39 CC Roger, Bill. You know the secondary - well, in fact, both reservicing procedures are available in a malfunction book, and sort of the problem with checking out the primary boiler is finding a way to make it boil on the way in.

04 19 46 03	LMP	Yes. Just a second, I got another little chore going here.
04 19 46 39	LMP	Roger. It looks like the only way we'll be able to do it would be to shut off the radiators.
04 19 46 48	CC	We were looking for a little more docile way to do that.
04 19 46 55	LMP	Roger. That way would be agreeable to me too, a little more docile way, but they shouldn't freeze up if we did it quickly.
04 19 47 08	CC	Roger. We are talking over several things, you know, like putting the ten-pin valve to MANUAL or partially closing it or some of these different ideas, and something you can think about while you are laying there with nothing else to do.
04 19 47 26	LMP	Yes. We noticed that it had gotten warmer in the cockpit coming back than it was going out. And I remember going out when we manually positioned the ten-pin valve, but we had pretty good control over the glycol evap outlet temperature. So possibly that would be the thing to attack first rather than the radiators.
04 19 47 49	CC	Okay. We've got the back room boys looking at it.
04 19 47 57	LMP	I guess if we do pick a time, though, we ought to pick a time that if something did go haywire, we could afford to boil ... the rest of the way in, but still leave us enought time to fix - rig up the evap service if it didn't work.

04 19 48 12	CC	That's affirm, and we're factoring in things like trajectory considerations and all that sort of thing, too.
04 19 48 22	LMP	Right. I think that the second derivative of the water boiler versus time plot will give us the optimum time to do it.
04 19 48 45	CC	EECOM's copying that.
04 19 48 52	CC	There's also speculation you have a chart on board that gives that information.
04 19 49 02	LMP	Well, if I don't, I'm sure those guys can ship one up. They've shipped up some other pretty good ones.
04 19 49 08	CC	It's also been suggested that if you don't have the chart it's on the tape recorder.
04 19 49 18	LMP	Well, if I don't have a chart, I'll put it on the tape recorder.
04 19 49 27	LMP	Okay. I think, unless you guys got some more comments along those lines, maybe we ought to give these guys a chance to get to sleep, and I'll recline here for a while. If you've got something to brief me on, well, go ahead; but I'd like to keep my answers to yes's and no's and whatever else you think you really need.
04 19 49 51	CC	Okay. Fine, Bill, and I'll check with you like every 30 minutes, just to make sure we still have voice contact.